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Efficacy of *yoga* in mild to moderate persistent chronic bronchial asthma

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The Global Initiative for asthma guidelines defined asthma as a chronic inflammatory disorder characterized by reversible airways obstruction and airways hyper-responsiveness. It is a chronic disease that cannot be cured but medicines and life style changes can help to control these symptoms. Now, GINA (Global Initiative for Asthma) has also considered breathing technique (*buteyko*) is helpful in controlling asthma. *Yoga* is one of the methods to increase muscular efficiency, endurance time and aerobic capacity, and can reduce perceived exertion after exercise. There are so many researches done in the field of asthma and many more review articles have presented the current situation of the disease but none of the review articles found in the field of *yoga* and asthma. A number of studies examine the benefits of *yoga* practice which help to manage asthma. People incorporating holistic program of *asana*, *pranayama* and meditation, had fewer weekly asthma attacks, improved breathing and better response to their medication. Finding of this review suggests that the regular practice of *yoga* can improve the quality of life of the patients with improvement in pulmonary functions. Therefore, *Yoga* is an effective tool in the management of asthma.

Keywords: Autonomic nervous system, Hyper-responsiveness, Hypoxic, Obstruction, *Pranayama, Yoga,* Bronchial asthma
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Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation. It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airflow limitation[1]. Asthma is a common chronic inflammatory airway disorder. It is very common in children, teens and adults. It is a condition where the air passages in the lungs become inflamed. The air passages are the airways that carry air in and out of the lungs. When the air passages get inflamed, it becomes red and swollen. It starts to swell and sticky mucous or phlegm is produced. All these factors cause the airways to become narrow and make it difficult to breath. Asthma attacks when the lungs are not getting enough air to breathe with the results of coughing, wheezing, shortness of breath and a tight feeling in the chest. Healthcare expenditure on asthma is very high. Asthma is disease with multiple phenotypes; some most common includes allergic asthma, non-allergic asthma, late onset asthma, asthma with fixed airway limitation, asthma with obesity[1].

Global asthma burden reported the prevalence of asthma is approximately 300 million cases all over the world and India has alone 30 million asthma patients (10% of the global burden). Asthma is increasing 50% per decade. Out of every 250 deaths, one is due to asthma worldwide[2]. There are so many researches done in the field of asthma and many more review article presented the current situation of the World but none of the review articles found in the field of yoga and asthma. *Yoga* is an ancient Science which accumulates mind, body and energy. The current review explains its efficacy in the management of mild to moderate persistent chronic bronchial asthma. Global Initiative for Asthma (GINA) has also considered breathing technique (*buteyko*) is helpful in controlling asthma[1].

India is not alone one of the country associated to asthma, it is worldwide and last few decades it has been rapidly increasing. The word *yoga* comes from a Sanskrit root '*yuj'* which means union, or yoke, to join, and to direct and concentrate one's attention[3-4]. Regular practice of *yoga* promotes strength, endurance, flexibility and facilitates characteristics of friendliness, compassion, and greater self-control, while cultivating a sense of calmness and well-being[5]. *Yoga* has been considered a best complementary and alternative medicine by the National Institutes of Health.

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Methodology

The goal of this review is to develop a comprehensive list of potentially relevant studies and to determine the efficacy of *yoga* in mild to moderate persistent chronic bronchial asthma patients.

Information sources

Literature search was performed by using the following electronic databases. Terms used in the searches were *yoga, pranayama*, asthma, randomized controlled study or trial.

Inclusion criteria

- Study participants were adults between 18-60 yrs of age.
- Presence of the two groups with asthma in the study.
- Randomly divided patients into the yoga group and to the control group
- Studies representing RCTs or RCT pilot study and related to *yoga* and *pranayama* after the year 1995.

Exclusion criteria

- Studies were excluded if not followed by GINA guidelines.
- Studies were not pertaining to the RCT study design
- Psychiatric or mental illnesses and any other associated respiratory diseases in the patients

Results

After following the criteria of inclusion and exclusion, 14 randomized controlled trials were reviewed for this article carefully reviewed in full text to be included in review literature. Further on data analysis and results of the RCT studies have been undertaken.

A randomized controlled study on 241 patients of mild to moderate persistent chronic bronchial asthma (121 patients of the *yoga* group and 120 patients of the control group) patients and concluded significant improvement in bio-chemical profile of asthmatics in the *yoga* group, superoxide dismutase activity also improved in *yoga* group than the controls[6]. They also reported that asthma symptom scores decreased significantly after the practice of *asanas, pranayama* and meditation for the period of 6-month practice in the *yoga* group in comparison to controls[7].

Pranayama nadishodhan and *kapalbhati* showed a significant result on forced ventilation capacity (FVC), maximum voluntary ventilation (MVV) and peak expiratory flow rate (PEFR)[8]. A study also concluded that *yoga* practice can be advocated for improvement of respiratory efficacy as well as an alternative therapy or as adjunct to conventional therapy in respiratory diseases[9].

A randomized controlled study of 60 patients that lung functions improved significantly in the patients of the *yoga* group after two months of the *yoga* practice from the baseline. *Pranayama* and *yoga* breathing are used to increase respiratory stamina, relax the chest muscles, expand the lungs, raise energy levels, and calm the body[10].

In a study the effect of *yoga* on asthmatic patients concluded that most of the subjects in the *yoga* group, showed a decreased number of day attacks per week and night attacks per month as compared to the control group. They also concluded a significant improvement in peak expiratory flow rate (PEFR). *Yoga* group showed 66.7 % reduction in the use of salbutamol puff and 58.3 % salbutamol tablets while control group showed only a reduction of 16.6% in the use of puff[11].

A study reported the significant change in FEV_1 and PEFR in the *yoga* group after the regular practice of *yoga* for 8 week of study period from the baseline, the frequency of rescue medication use significantly decreased over the study period in *yoga* group and control groups. But, the decrease was achieved relatively earlier and was more marked in the *yoga* group than in the control group. This study supported the efficacy of *yoga* in the management of bronchial asthma[12].

In a study the effect of *yoga* training on pulmonary functions concluded that *yoga* breathing exercises are beneficial in asthmatic patients and used adjunctively with standard pharmacological treatment significantly improves pulmonary functions in patients with bronchial asthma[13].

Some studies have found that *pranayama* reduces stress, a common asthma trigger. Breathing techniques and improved control of breathing by *yoga* may contribute to the control of asthma symptoms. Breathing exercises emphasized in *yoga* have the potential to improve lung function and quality of life in asthmatics[14-15].

A study reported the effect of *buteyko* technique and *pranayama* in the bronchial asthma patients for 6 month period and concluded that no significant change was found in lung functions of the patients. The *buteyko* breathing technique (The Pink City Lung

Exerciser) and *pranayama* can improve symptoms and reduce bronchodilator use[16].

A randomized controlled trial concluded that the practice of *Sahaja yoga* has limited beneficial effects on asthma. *Sahaja Yoga* is a traditional system of meditation based on yogic principles which may be used for therapeutic purposes. Another study on Iyengar *yoga*, a form of *yoga* known for using props such as belts and blocks as aids in performing postures, conferred no appreciable benefit in mild-to-moderate asthma[17]. Effectiveness of relaxation therapy has been studied in a group of asthmatics; it was found that mental relaxation was more effective than muscular relaxation in the improvement of pulmonary function and subjective measures[18].

A study has been performed by on 17 bronchial asthma patients age ranged between 19-52 yrs. The results of this study showed that the subjects in the *yoga* group reported a significant degree of relaxation, positive attitude, and better *yoga* exercise tolerance. There was also a tendency toward lesser usage of beta adrenergic inhalers. The pulmonary functions did not vary significantly between *yoga* group and control group. *Yoga* techniques seem beneficial as an adjunct to the medical management of asthma[19].

Discussion

Yoga is a Science common to all and whole humanity in its true nature of efficacy, results and applications. *Yoga* is known for its beneficial effects on physiologic and psychologic functions[20-22]. *Yoga* improves the immunity. With a regular practice of *yoga* immune system becomes strong. The buffering effect of *yoga* on stress induced decrease in cellular immunity may be due to its ameliorating action on HPA, creating an optimized secretion of cortisol[23]. During the last 3 decades, extensive physiologic researches have been done on yogic practices. It has been reported that *yoga* can increase muscular efficiency, endurance time and aerobic capacity, and can reduce perceived exertion after exercise[14].

Tensions at the physical and anxiety at the mental level can be minimized through the regular and sincere practice of *yoga*[24]. A short term study on a 9 asthma patients demonstrated no significant change in FVC, FEV_1 and PEFR[25]. A case-control study of 41 patients reported that none of the patients had a reduction of more than 30 % in Peak Expiratory Flow (PEF) before the onset of symptoms. Daily variation in PEF was not significantly increased from the baseline. Their results demonstrated that PEF monitoring is not as sensitive as a symptom diary for revealing acute exacerbations of asthma, and that a 30 % decrease in PEF is too strict a criterion for defining an acute exacerbation[26]. A study reported that PEF monitoring is more useful than asthma score to change the symptoms of asthma more rapidly because PEF showed the change one month before asthma score showed the attacks[27].

Stress can be sufficient to induce breathlessness in patients with asthma[28]. Patients with severe asthma have high levels of distress, particularly anxiety, even between attacks. Their attitude to their illness are multi-factorial and are significantly correlated with emotional distress, morbidity induces and some demographic factors. Since, stress can exacerbate asthma attack; reducing stress is an important intervention for prevention and management of asthma. *Yoga* is used to reduce stress and thus helps in the management of asthma[29].

Conclusion

Yoga is one of the complementary medicines which put a great impact on human body. There are more evidences in favor of *yoga* practices but it should be remember that *yoga* alone cannot be used as a treatment modality. It can have a complementary role and more useful in prevention of metabolic and non-communicable diseases. Finding of this review suggests that the regular practice of *yoga* can improve the quality of life of the patients with improvement in pulmonary functions. *Yoga* is an effective tool in the management of asthma and more scientific studies are required in this area to utilize the maximum benefit from this ancient magical Science.

Limitations of the study

There is limited number of well-designed studies exploring beneficial effects of *yoga* on asthma. Due to the small number of controlled trials and least number of patients studied, it is not possible to make firm judgments regarding the long-term efficacy of using yoga to control asthma attack. It is recommended that to more carefully construct randomized controlled trials using strict methodological quality be required to allow generalized conclusion.

Suggestions for future work

- Generalization of *Yoga* program for different cultures needs to be assessed.
- Randomized controlled trials with large number of sample size for long term should be done for the efficacy of *yoga*.

- After analyzing the papers reviewed in this article, following *yogasanas* are recommended as beneficial in the asthma disease:
  - *Gomukhasana*
  - *Ardhamatsyendrasana*
  - *Paschimottanasana*
  - *Bhujangasana*
  - *Dhanurasana*
  - *Naukasana*
  - *Parvatasana*
  - *Tadasana*
  - *Shavasana*
  - *Pranayama Nadishodhan*
  - *Pranayama Bhastrika*
  - *Pranayama Bhramari*
  - Meditation

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